

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A method Method for providing Quality of Service (QoS) to an Ethernet switching means connected to a Wide Area Network (WAN), which has at least one bandwidth limited channel, wherein a total IP data throughput of voice-, video- and/or other real time applications or services together with ~~none real time~~ non-real time applications or services are provided by use of IP data packages, wherein ~~characterised in that~~ the Ethernet switching means is logically connected to an Adaptive Quality of Service (AQS) means, comprising the steps of: ~~and that the method comprises following steps:~~

[[~~-~~]] ~~acquisition of the~~ acquiring Quality of Service information carried in the RTP/RTCP data packages (~~step 110; 126~~);

[[~~-~~]] comparing at least one QoS value Q_n to a corresponding QoS acceptance ratio, wherein each Q_n is based on the Quality of Service information from the RTP/RTCP data packages, ~~to a corresponding QoS acceptance ratio (step 112; 128);~~ and

[[~~-~~]] filtering when at least one QoS value has an unacceptable level to said corresponding QoS acceptance ratio (~~step 114; 130~~).

2. (Currently Amended) The method ~~A method~~ according to claim 1, further comprising: ~~characterised in that the method comprises following steps:~~

[[~~-~~]] ~~acquisition of~~ acquiring a value (TB) for the instantaneous used bandwidth of the total IP data throughput (~~step 102; 122~~);

[[~~-~~]] comparing the used bandwidth value (TB) of the total IP data throughput to a minimum value m (~~step 104; 104~~);

~~[[-]] acquisition of~~ acquiring the Quality of service information carried in the RTP/RTCP data packages ~~(step 110; 126)~~, if the total data throughput exceeds the minimum value m.

3. (Currently Amended) The method ~~A method~~ according to claim 1, further comprising ~~characterised in that~~

~~[[-]] acquisition of~~ acquiring QoS-values carried by the passing RTP/RTCP data packages of voice-, video- and/or other real time applications or services;

~~[[-]] comparing the~~ QoS-values for packages loss ratio, jitter ratio and/or maximum delay with corresponding QoS acceptance ratio.

4. (Currently Amended) The method ~~Method~~ according to claim 1, ~~characterised in that~~ wherein the filtering is stopped, if the used bandwidth value (TB) of the total IP throughput declines a deactivation threshold value (F_d).

5. (Currently Amended) The method ~~Method~~ according to claim 1, wherein ~~characterised in that~~ the filtering is stopped, if at least one of the QoS values is acceptable ~~(step 116; 132)~~.

6. (Currently Amended) The method ~~Method~~ according to claim 1, ~~characterised by~~ further comprising the step of controlling the filtering means according to configurable filter criteria, causing the filtering means to be capable of filtering adaptively the total IP data throughput stream depending on port, MAC-address, IP-address, session-ID or other criteria.

7. (Currently Amended) The method ~~Method~~ according to claim 1, ~~characterised by~~ further comprising the steps of setting the controlling means in either of two operation modes:

~~[[-]] a first mode - Simple mode - when at least one of the QoS values is found to be not acceptable, or~~

[[-]] a second mode - Advanced mode - when all QoS values are found to be not acceptable.

8. (Currently Amended) The method ~~Method~~ according to claim 4, wherein ~~characterised in that~~ the deactivation threshold value (F_d) is a predefined value available throughput buffer level.

9. (Currently Amended) The method ~~Method~~ according to claim 5 further comprising the step of ~~4 or 5, characterised by~~ using a predefined time period (t) from the time point when the declining of the minimum value (m) was detected before deactivating the filtering process.

10. (Currently Amended) The method ~~A method~~ according to claim 2, wherein ~~characterised in that~~ the minimum value (m) is configured to be equal to or less than the guaranteed minimum bandwidth (GMB) of the WAN.

11. (Currently Amended) The method ~~A method~~ according to claim 3, wherein ~~characterised in that~~ the filter deactivation threshold value (F_d) is configured to be equal to or less than the minimum value (m), where the minimum value (m) is a positive number.

12. (Currently Amended) The method ~~A method~~ according to claim 2, further comprising ~~characterised by~~ the step of acquiring and analysing the QoS information of the RTP-header fields of the downwards packages and the QoS information of the RTCP Sender Report and/or Receiver Report on the WAN.

13. (Currently Amended) A system (12) for providing Quality of Service (QoS) to an Ethernet switching means (22) connected to a Wide Area Network (WAN), which has at least one bandwidth limited channel, wherein a total IP data throughput stream of voice-, video- and/or other real time applications or services together with ~~none real time~~ non-realtime applications or services are provided by use of IP data

packages, wherein ~~characterised in that~~ said Ethernet switching means (22) is logically connected to an Adaptive Quality of Service (AQS) means (24), comprising: which includes

acquisition means (34) and comparing means (36) of a monitoring means (28) being that is capable of

identifying an unacceptable QoS level based upon the monitoring of Quality of Service information carried in RTP/RTCP data packages and

indicating said unacceptable QoS state to a filter controlling means (30) that controls a filtering means (32) for filtering the total IP data throughput stream.

14. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 13, wherein ~~characterised in that~~ the Adaptive Quality of Service (AQS) means (24) further comprises:

second acquisition means (34b) for acquisition of the Quality of service information carried in the RTP/RTCP data packages,

second comparing means (36b) for comparing at least one QoS value (Q_n), which is based upon the Quality of service information carried in the RTP/RTCP data packages, to a corresponding QoS acceptance ratio, and

filtering means (32) for filtering the total IP data throughput stream, when at least one QoS value (Q_n) has an unacceptable level compared to said corresponding QoS acceptance ratio.

15. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 14, wherein ~~characterised in that~~ the Adaptive Quality of Service (AQS) means (24) also comprises

a first acquisition means (34a) for acquisition of a value (TB) for the instantaneous used bandwidth of the total IP data throughput stream and

first comparing means (36a) for comparing the bandwidth value (TB) to a minimum value (m).

16. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 15, wherein ~~characterised in that~~ the second acquisition means ~~(34a)~~ for acquisition of the Quality of service information carried in the RTP/RTCP data packages is activated, if the bandwidth value (TB) exceeds the minimum value (m).

17. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 15, wherein ~~characterised in that~~ the first comparing means ~~(36a)~~ comprises the minimum value (m), ~~that is possible to configure~~ can be configured to be equal to or less than the guaranteed minimum bandwidth (GMB) of the WAN.

18. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 16, wherein ~~characterised in that~~ the first comparing means comprises a filter deactivation threshold value (F_d), ~~that can be configured~~ possible to configure to be equal to or less than the minimum value (m, which is a positive figure).

19. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 15, wherein ~~characterised in that~~ the first comparing means ~~(36a)~~ disables the filtering means ~~(32)~~ and said controlling means ~~(30)~~, if the bandwidth value (TB) declines the deactivation threshold value (F_d).

20. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 13, wherein ~~characterised in that~~ the filter controlling means ~~(30)~~ controls the filtering means ~~(32)~~ according to configurable filter criteria, causing the filtering means ~~(32)~~ to be capable of filtering adaptively among the total IP data throughput depending on port, MAC-address, IP-address, session-ID or other criteria.

21. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 14, wherein ~~characterised in that~~ the second acquisition means ~~(36b)~~ acquires and analyses the QoS information of RTP-header fields of the downwards packages and the QoS information of the RTCP Sender Report and / or Receiver Report on the WAN.

22. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 14, characterised in that the controlling means (30) operates in either of two modes:

~~[[-]]~~ a first mode - Simple mode - when at least one of the QoS values Q_n is found to be not acceptable; or

~~[[-]]~~ a second mode - Advanced mode - when all QoS values Q_n are found to be not acceptable.

23. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 13, wherein ~~characterised in that~~ the filtering means (32) is deactivated, when the QoS values Q_n for packages loss, optional jitter and delay are detected by the second comparing means (36b) to be within an acceptable range.

24. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 15, wherein ~~characterised in that~~ the controlling means (30) deactivates the filtering means (32) a predefined expiration time period (t) from the time point when the declining of the minimum value (m) was detected.

25. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 13, further comprising ~~characterised in that the device comprises~~ a gateway (26).

26. (Currently Amended) The ~~[[A]]~~ system (12) according to claim 13, wherein ~~characterised in that~~ the Adaptive QoS means (24) comprising monitoring means (28) for monitoring the total IP data throughput on the switch based aggregation system (12), the filtering means (32) being capable of filtering the total IP data throughput and the controlling means (30) for controlling said filtering means (32) depending on the monitoring of the total IP data throughput on the switch based aggregation system (12) and filter criteria, said all means and filter criteria may be implemented as computer program and computer readable code stored on a computer readable product or in a computer readable storage for processing ~~in a specialised computer, server, personal computer, Digital Processor, Central Processing Unit, etc.~~

27. (Currently Amended) The ~~[[A]]~~ system ~~(12)~~ according to claim 26, wherein characterised in that the computer program may be loaded to the AQS ~~(24)~~ from a server ~~(38)~~ as a FTP (general File Transfer Protocol) file transfer, TFTP (Trivial File Transfer Protocol) or other transfer protocol suitable for computer program transfer and a Management Platform ~~(40)~~ may remotely control the AQS means ~~(24)~~ and the Switch Based Aggregation system ~~(42)~~ and configure the AQS means ~~(24)~~ with jitter ratio, Packet (Packages) Loss ratio, Packages delay, filter method, filter criteria, activation upstream upstreams and/or downstream downstreams.

28.-29. (Canceled)

30. (New) A computer program product having computer readable program code stored on a computer useable medium for providing Quality of Service (QoS) to an Ethernet switching means that is connected to a Wide Area Network (WAN), which has at least one bandwidth limited channel, wherein a total IP data throughput of voice-, video- and/or other real time applications or services together with non-realtime applications or services are provided by use of IP data packages, wherein the Ethernet switching means is logically connected to an Adaptive Quality of Service (AQS) means, the computer readable program code comprises code for:

- acquiring Quality of Service information carried in the RTP/RTCP data packages;
- comparing at least one QoS value Q_n to a corresponding QoS acceptance ratio, wherein each Q_n is based on the Quality of Service information from the RTP/RTCP data packages; and

- filtering when at least one QoS value has an unacceptable level to said corresponding QoS acceptance ratio.

31. (New) The computer program product of claim 30 further comprising program code for:

- acquiring a value (TB) for the instantaneous used bandwidth of the total IP data throughput;

comparing the used bandwidth value (TB) of the total IP data throughput to a minimum value m;

acquiring the Quality of service information carried in the RTP/RTCP data packages, if the total data throughput exceeds the minimum value m.

32. (New) The computer program product of claim 30 further comprising program code for:

acquiring QoS-values carried by the passing RTP/RTCP data packages of voice, video- and/or other real time applications or services;

comparing the QoS-values for packages loss ratio, jitter ratio and/or maximum delay with corresponding QoS acceptance ratio.

33. (New) The computer program product of claim 30, wherein the filtering is stopped, if the used bandwidth value (TB) of the total IP throughput declines a deactivation threshold value (F_d).

34. (New) The computer program product of claim 30 wherein the filtering is stopped, if at least one of the QoS values is acceptable.

35. (New) The computer program product of claim 30 further comprising program code for controlling the filtering means according to configurable filter criteria, causing the filtering means to be capable of filtering adaptively the total IP data throughput stream depending on port, MAC-address, IP-address, session-ID or other criteria.

36. (New) The computer program product of claim 30 further comprising program code for setting the controlling means in either of two operation modes:

a first mode - Simple mode - when at least one of the QoS values is found to be not acceptable, and

a second mode - Advanced mode - when all QoS values are found to be not acceptable.

37. (New) The computer program product of claim 33 wherein the deactivation threshold value (F_d) is a predefined value available throughput buffer level.

38. (New) The computer program product of claim 34 further comprising program code for using a predefined time period (t) from the time point when the declining of the minimum value (m) was detected before deactivating the filtering process.

39. (New) The computer program product of claim 31 wherein the minimum value (m) is configured to be equal to or less than the guaranteed minimum bandwidth (GMB) of the WAN.

40. (New) The computer program product of claim 32 wherein the filter deactivation threshold value (F_d) is configured to be equal to or less than the minimum value (m), where the minimum value (m) is a positive number.

41. (New) The computer program product of claim 31 further comprising program code for acquiring and analysing the QoS information of the RTP-header fields of the downwards packages and the QoS information of the RTCP Sender Report and/or Receiver Report on the WAN.